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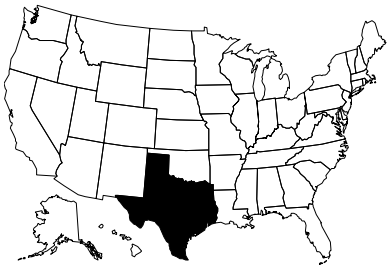

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Program Description

Since the late 1980s, biological assessments have been employed for use attainability analyses (UAAs) and the development of an index of biological integrity (IBI) for rivers and streams. A tidal streams IBI is in the preliminary stages of development. Recently, a new emphasis has been placed on bioassessments relative to 303(d) listed waterbodies. For the most part, the new data have not been fully evaluated and work is continuing to expand in this area. Also, for the first time, the draft 2002 Water Quality Inventory includes bioassessments to determine the support of aquatic life uses.

The Texas Parks and Wildlife Department (TPWD) has been a major provider of fish community data for many of the UAAs and the development of the IBI. Other providers include various river authorities in the state.

***NOTE: On September 1, 2002, the Texas Natural Resources Conservation Commission (TNRCC) formally changed its name and began doing business as the Texas Commission on Environmental Quality (TCEQ).**

Documentation and Further Information

Draft 2002 Texas Water Quality Monitoring and Assessment Report (Integrated 305(b) report and 303(d) list):
http://www.tnrcc.state.tx.us/water/quality/02_twqmar/index.html

Texas Water Quality Inventory (SFR-050/00), includes *Volume I: Surface Water, Groundwater and Finished Drinking Water Assessments and Water Quality Management Programs:*
http://www.tnrcc.state.tx.us/admin/topdoc/sfr/050_00/050_00.html#1

Revisions to the Texas Surface Water Quality Standards and Implementation Procedures:
http://www.tnrcc.state.tx.us/permitting/waterperm/wqstand/revisions.html

Surface Water Quality Monitoring Procedures Manual (Chapter 7: Biological Sampling Procedures and Chapter 8: Stream Habitat Assessment Procedures), August 1999, GI-252:
http://www.tnrcc.state.tx.us/admin/topdoc/gi/252.html

Monitoring and Receiving Water Assessment Procedures Manuals:
http://www.tnrcc.state.tx.us/water/quality/data/wqm/index.html#manuals

Surface Water Quality Monitoring Program information:
http://www.tnrcc.state.tx.us/water/quality/data/wqm/index.html

Leppo, E.W., M.T. Barbour, and J. Gerritsen. 2001. *An evaluation of the stream habitat assessment approach used by TNRCC*. Prepared for: Texas Natural Resource and Conservation Commission, Austin, Texas and USEPA Region 6, Dallas, Texas.

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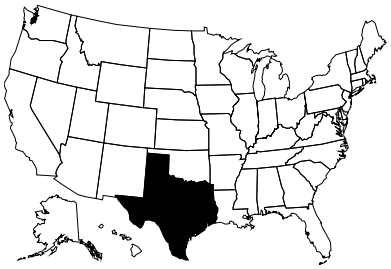

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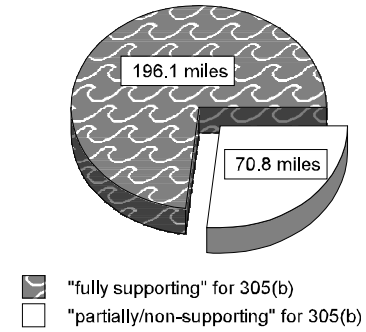
Programmatic Elements

Uses of bioassessment within overall water quality program	✓	problem identification (screening)
		nonpoint source assessments
		monitoring the effectiveness of BMPs
	✓	ALU determinations/ambient monitoring
	✓	promulgated into state water quality standards as biocriteria
		support of antidegradation
	✓	evaluation of discharge permit conditions
	✓	TMDL assessment and monitoring
		other:
Applicable monitoring designs	✓	targeted (i.e., sites selected for specific purpose) *(special projects, specific river basins or watersheds, and comprehensive use throughout jurisdiction)*
	✓	fixed station (i.e., water quality monitoring stations) *(specific river basins or watersheds and comprehensive use throughout jurisdiction)*
		probabilistic by stream order/catchment area
	✓	probabilistic by ecoregion, or statewide *(special projects only)*
		rotating basin
		other:

Stream Miles

Total miles *(State based determination)*	**191,228**
Total perennial miles	40,194
Total miles assessed for biology*	**266.9**
fully supporting for 305(b)	196.1
partially/non-supporting for 305(b)	70.8
listed for 303(d)	–
number of sites sampled *(on an annual basis)**	30
number of miles assessed per site	–

266.9 Miles Assessed for Biology



*68,611.78 total miles were surveyed and 63,102.68 total miles were assessed. Of these, 266.9 miles were assessed using biology. 30 sites were surveyed and 16 sites were assessed.

Aquatic Life Use (ALU) Designations and Decision-Making

ALU designation basis	Class System (A,B,C)	
ALU designations in state water quality standards	Five designations: Exceptional, High, Intermediate, Limited, and Oyster waters	
Narrative Biocriteria in WQS	Procedures used to support narrative biocriteria located in the *Water Quality Standards Implementation Procedures Receiving Water Assessment Procedures Manual* (see documentation)	
Numeric Biocriteria in WQS	none	
Uses of bioassessment data in integrated assessments with other environmental data (e.g., toxicity testing and chemical specific criteria)	✓	assessment of aquatic resources
	✓	cause and effect determinations
	✓	permitted discharges
	✓	monitoring (e.g., improvements after mitigation)
		watershed based management
Uses of bioassessment/ biocriteria in making management decisions regarding restoration of aquatic resources to a designated ALU	Trinity River Segment 0805 was elevated from a limited aquatic life use to a high aquatic life use designation. EPA Region 6 considers Texas' high and exceptional aquatic life use designations as meeting the 101(a) goals of the Clean Water Act.	

Reference Site/Condition Development

Number of reference sites	**72 total**	
Reference site determinations	✓	site-specific
	✓	paired watersheds
	✓	regional (aggregate of sites)
	✓	professional judgment
		other:
Reference site criteria	no point source discharge, land use patterns, limited human impact, least disturbed sites determined using best professional judgment	
Characterization of reference sites within a regional context		historical conditions
	✓	least disturbed sites
		gradient response
		professional judgment
		other:
Stream stratification within regional reference conditions	✓	ecoregions (or some aggregate)
		elevation
		stream type
		multivariate grouping
		jurisdictional (i.e., statewide)
		other:
Additional information	✓	reference sites linked to ALU
		reference sites/condition referenced in water quality standards
	✓	some reference sites represent acceptable human-induced conditions

Field and Lab Methods

Assemblages assessed	✓	benthos *(<100 samples/year; multiple seasons, multiple sites – broad coverage for watershed level)*
	✓	fish *(<100 samples/year; multiple seasons, multiple sites – broad coverage for watershed level)*
		periphyton
		other:
Benthos		
sampling gear		surber, multiplate, lopping shears for collecting woody debris, D-frame, kick net; 500-600 micron mesh
habitat selection		riffle/run (cobble), artificial substrate and woody debris
subsample size		100 count and entire sample
taxonomy		combination
Fish		
sampling gear		backpack and boat electrofisher, trawl and gill net (particularly for tidal streams), seine; 1/8", 3/16" and 1/4" mesh
habitat selection		multihabitat
sample processing		length measurement, batch, anomalies
subsample		none
taxonomy		species
Habitat assessments		quantitative measurements; performed with bioassessments
Quality assurance program elements		standard operating procedures, quality assurance plan, periodic meetings and training for biologists, taxonomic proficiency checks, specimen archival

Data Analysis and Interpretation

Data analysis tools and methods	✓	summary tables, illustrative graphs
	✓	parametric ANOVAs
		multivariate analysis
	✓	biological metrics *(aggregate metrics into an index)*
		disturbance gradients
		other:
Multimetric thresholds		
transforming metrics into unitless scores		95th percentile of reference population
defining impairment in a multimetric index		50th percentile of reference population (follow EPA RBP guidelines)
Evaluation of performance characteristics		repeat sampling
		precision
Not currently evaluated		sensitivity
		bias
		accuracy
Biological data		
Storage		TCEQ's TRACS database and hard copies; STORET is under development
Retrieval and analysis		At this time, the hard copies are primarily used for evaluation of biological data. Spreadsheets are also used.